Release notes for ENDF/B Development photoat-088_Ra_000 evaluation

October 13, 2016

- `checkr`   Warnings:

  1. A previous error halted parsing of the current section
     MAT=8800, MF= 1, MT=451 (1): Parsing stopped

     ```
     ERROR(S) FOUND IN MAT=8800, MF= 1, MT=451
         SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      168 TO     205
     ```

- `checkr`   Errors:

  1. A variable is outside the allowed ENDF range
     MAT=8800, MF= 1, MT=451 (0): Variable range

     ```
     ERROR(S) FOUND IN MAT=8800, MF= 1, MT=451
         MOD =    3 OUT OF RANGE    0 -    1            RECORD NUMBER     168
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=501 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8800, MF=23, MT=501
         SECTION 23/501 NOT IN DIRECTORY               RECORD NUMBER     207
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=502 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8800, MF=23, MT=502
         SECTION 23/502 NOT IN DIRECTORY               RECORD NUMBER    1175
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=504 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8800, MF=23, MT=504
         SECTION 23/504 NOT IN DIRECTORY               RECORD NUMBER    1658
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=515 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8800, MF=23, MT=515
         SECTION 23/515 NOT IN DIRECTORY               RECORD NUMBER    1699
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=516 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8800, MF=23, MT=516
         SECTION 23/516 NOT IN DIRECTORY               RECORD NUMBER    1734
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8800, MF=23, MT=517 (0): Directory (b)

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```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=517
            SECTION 23/517 NOT IN DIRECTORY                    RECORD NUMBER    1789
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=8800, MF=23, MT=522 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=522
            SECTION 23/522 NOT IN DIRECTORY                    RECORD NUMBER    1831
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=8800, MF=23, MT=534 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=534
            SECTION 23/534 NOT IN DIRECTORY                    RECORD NUMBER    2247
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=535 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=535
            SECTION 23/535 NOT IN DIRECTORY                    RECORD NUMBER    2267
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=536 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=536
            SECTION 23/536 NOT IN DIRECTORY                    RECORD NUMBER    2290
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=537 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=537
            SECTION 23/537 NOT IN DIRECTORY                    RECORD NUMBER    2312
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=538 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=538
            SECTION 23/538 NOT IN DIRECTORY                    RECORD NUMBER    2336
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=539 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=539
            SECTION 23/539 NOT IN DIRECTORY                    RECORD NUMBER    2361
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=540 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=540
           SECTION 23/540 NOT IN DIRECTORY                RECORD NUMBER    2388
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=541 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=541
           SECTION 23/541 NOT IN DIRECTORY                RECORD NUMBER    2416
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=542 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=542
           SECTION 23/542 NOT IN DIRECTORY                RECORD NUMBER    2445
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=543 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=543
           SECTION 23/543 NOT IN DIRECTORY                RECORD NUMBER    2476
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=544 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=544
           SECTION 23/544 NOT IN DIRECTORY                RECORD NUMBER    2503
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=545 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=545
           SECTION 23/545 NOT IN DIRECTORY                RECORD NUMBER    2534
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=546 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=546
           SECTION 23/546 NOT IN DIRECTORY                RECORD NUMBER    2565
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=547 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=547
           SECTION 23/547 NOT IN DIRECTORY                RECORD NUMBER    2603
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=548 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=548
          SECTION 23/548 NOT IN DIRECTORY                    RECORD NUMBER    2640
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=549 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=549
          SECTION 23/549 NOT IN DIRECTORY                    RECORD NUMBER    2699
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=550 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=550
          SECTION 23/550 NOT IN DIRECTORY                    RECORD NUMBER    2759
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=551 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=551
          SECTION 23/551 NOT IN DIRECTORY                    RECORD NUMBER    2789
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=552 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=552
          SECTION 23/552 NOT IN DIRECTORY                    RECORD NUMBER    2826
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=553 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=553
          SECTION 23/553 NOT IN DIRECTORY                    RECORD NUMBER    2865
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=554 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=554
          SECTION 23/554 NOT IN DIRECTORY                    RECORD NUMBER    2914
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=559 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=559
          SECTION 23/559 NOT IN DIRECTORY                    RECORD NUMBER    2965
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8800, MF=23, MT=560 (0): Directory (b)

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```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=560
            SECTION 23/560 NOT IN DIRECTORY                    RECORD NUMBER    3003
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=23, MT=561 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=561
            SECTION 23/561 NOT IN DIRECTORY                    RECORD NUMBER    3044
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=23, MT=570 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=23, MT=570
            SECTION 23/570 NOT IN DIRECTORY                    RECORD NUMBER    3086
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=27, MT=502 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=27, MT=502
            SECTION 27/502 NOT IN DIRECTORY                    RECORD NUMBER    3125
```

35. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=27, MT=504 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=27, MT=504
            SECTION 27/504 NOT IN DIRECTORY                    RECORD NUMBER    3175
```

36. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=27, MT=505 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=27, MT=505
            SECTION 27/505 NOT IN DIRECTORY                    RECORD NUMBER    3226
```

37. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8800, MF=27, MT=506 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=8800, MF=27, MT=506
            SECTION 27/506 NOT IN DIRECTORY                    RECORD NUMBER    3422
```

- `fudge-4.0` Warnings:

  1. generic warning message
  reaction label 0: Ra + gamma [coherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: coherentScattering is not a valid distribution component for 2-body reaction
     ```

  2. FIXME: Generic fudge unimplemented message
  reaction label 0: Ra + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

```
WARNING: Checking not yet implemented for pointwise type data
```

3. generic warning message
   reaction label 1: Ra + gamma [incoherent] / Product: gamma (Error # 0): Warning

```
WARNING: incoherentScattering is not a valid distribution component for 2-body reaction
```

4. FIXME: Generic fudge unimplemented message
   reaction label 1: Ra + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

```
WARNING: Checking not yet implemented for piecewise type data
```

5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
   summedReaction label 29: total (Error # 0): Sumrule

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%
```

6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
   summedReaction label 31: photoelectric absorption (Error # 0): Sumrule

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 99.22%
```

- `fudge-4.0` Errors:

   1. Calculated and tabulated thresholds don't agree
      reaction label 0: Ra + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
   ```

   2. 2-body reaction not in center-of-mass frame
      reaction label 0: Ra + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

   ```
   WARNING: 2-body reaction not in center-of-mass frame!
   ```

   3. Calculated and tabulated thresholds don't agree
      reaction label 1: Ra + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
   ```

   4. 2-body reaction not in center-of-mass frame
      reaction label 1: Ra + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

   ```
   WARNING: 2-body reaction not in center-of-mass frame!
   ```

   5. Energy range of data set does not match cross section range
      reaction label 1: Ra + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

   ```
   WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
   ```

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6. Calculated and tabulated thresholds don't agree
reaction label 2: e- + e+ + Ra [electron field] / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
```

7. Calculated and tabulated thresholds don't agree
reaction label 3: e- + e+ + Ra [nuclear field] / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
```

8. Calculated and tabulated thresholds don't agree
reaction label 4: e- + Ra1s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 104320. eV!
```

9. Calculated and tabulated thresholds don't agree
reaction label 5: e- + Ra2s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 19232. eV!
```

10. Calculated and tabulated thresholds don't agree
reaction label 6: e- + Ra2p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 18560. eV!
```

11. Calculated and tabulated thresholds don't agree
reaction label 7: e- + Ra2p3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 15456. eV!
```

12. Calculated and tabulated thresholds don't agree
reaction label 8: e- + Ra3s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4795.1 eV!
```

13. Calculated and tabulated thresholds don't agree
reaction label 9: e- + Ra3p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4482. eV!
```

14. Calculated and tabulated thresholds don't agree
reaction label 10: e- + Ra3p3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3773.7 eV!
```

15. Calculated and tabulated thresholds don't agree
reaction label 11: e- + Ra3d3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3258.7 eV!
```

16. Calculated and tabulated thresholds don't agree
reaction label 12: e- + Ra3d5/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3111.3 eV!
```

17. Calculated and tabulated thresholds don't agree
    reaction label 13: e- + Ra4s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1189.7 eV!
    ```

18. Calculated and tabulated thresholds don't agree
    reaction label 14: e- + Ra4p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1048.6 eV!
    ```

19. Calculated and tabulated thresholds don't agree
    reaction label 15: e- + Ra4p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 867.3099999999999 eV!
    ```

20. Calculated and tabulated thresholds don't agree
    reaction label 16: e- + Ra4d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 636.77 eV!
    ```

21. Calculated and tabulated thresholds don't agree
    reaction label 17: e- + Ra4d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 603.0599999999999 eV!
    ```

22. Calculated and tabulated thresholds don't agree
    reaction label 18: e- + Ra4f5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 299.7 eV!
    ```

23. Calculated and tabulated thresholds don't agree
    reaction label 19: e- + Ra4f7/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 291.19 eV!
    ```

24. Calculated and tabulated thresholds don't agree
    reaction label 20: e- + Ra5s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 253.63 eV!
    ```

25. Calculated and tabulated thresholds don't agree
    reaction label 21: e- + Ra5p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 200.32 eV!
    ```

26. Calculated and tabulated thresholds don't agree
    reaction label 22: e- + Ra5p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 159.83 eV!
    ```

27. Calculated and tabulated thresholds don't agree
    reaction label 23: e- + Ra5d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 81.31999999999999 eV!
    ```

28. Calculated and tabulated thresholds don't agree
    reaction label 24: e- + Ra5d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 75.52 eV!
    ```

29. Calculated and tabulated thresholds don't agree
    reaction label 25: e- + Ra6s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 39.54 eV!
    ```

30. Calculated and tabulated thresholds don't agree
    reaction label 26: e- + Ra6p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 24.88 eV!
    ```

31. Calculated and tabulated thresholds don't agree
    reaction label 27: e- + Ra6p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 18.62 eV!
    ```

32. Calculated and tabulated thresholds don't agree
    reaction label 28: e- + Ra7s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.73 eV!
    ```

33. Calculated and tabulated thresholds don't agree
    summedReaction label 29: total / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
    ```

34. Calculated and tabulated thresholds don't agree
    summedReaction label 30: pair product / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
    ```

35. Calculated and tabulated thresholds don't agree
    summedReaction label 31: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.73 eV!
    ```

- `xsectplotter`   Warnings:

    1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
       Error: RuntimeWarning

       ```
       stderr while processing crossSection

       /usr/local/lib/python2.7/site-packages/matplotlib-1.3.1-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:412: Runtime
       ... [3 more lines]
       ```